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10/645,617	08/22/2003	Osamu Shimamura	50195-379	8268
7590 12/07/2006 McDERMOTT, WILL & EMERY 600 13th Street, N.W. Washington, DC 20005-3096			EXAMINER LEWIS, BEN	
			ART UNIT 1745	PAPER NUMBER

DATE MAILED: 12/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/645,617

Applicant(s)

SHIMAMURA ET AL.

Examiner

Ben Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 9/14/2006.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application
- ☐ Other: ____.

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Detailed Action

1. The Applicant's amendment filed on September 14th, 2006 was received. Claims 1, 5, 6, 7, 8 and 9 were amended. Claims 10-13 were added. Claim 2 was cancelled.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action (issued on June 14th, 2006).

Claim Rejections - 35 USC § 102

3. The claim rejections under 35 U.S.C. 102(b) as anticipated by Hayama et al. (U.S. Patent No. 6,225,778 B1) on claims 1, 2, 4, 5 and 9 are withdrawn, because the independent claim 1 has been amended.

Claim Rejections - 35 USC § 103

4. Claims 1, 4, 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et al. (U.S. Patent No. 6,225,778 B1) in view of Suzuki et al. (Japanese Pub. No. 11-345599) and further in view of Scott (U.S. Patent No. 5,425,203).

With respect to claims 1 and 9-12, Hayama et al. disclose a battery pack wherein according to the present invention, there is provided a battery pack which comprises a flat battery cell including a flat electric power generating element, at least one armor material for sealing the flat electric power generating element, and a positive tab and a

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negative tab extending from the electric power generating element to the outside of the armor material through sealings of the armor material; a circuit board connected to the positive tab and the negative tab; and a container having two main walls extending along two main surfaces of the flat battery cell (Col 4 lines 33-50).

Regarding a laminate film formed by combining polymer and metal with each other, Hayama et al teach that the battery pack 20 of FIG. 7, the upper case (first case half) is not limited to that made of resin, but may be made, for example, of metal. With the upper case made of metal, a metal plate may be pressed to fabricate the first case half. Alternatively, the first case half may be cast by injection molding or the like. Metal materials used for the first case half may include aluminum, stainless steel, aluminum alloy, magnesium alloy, cold rolled steel plate, hot rolled steel plate, plated steel plate, and so on. Then, as a metal plate used for the second case half, similar metal plates to those mentioned above may be used. It should be noted that in the battery pack 20, when the first case half is made of metal, the second case half for use in combination with this must be such one that is composed of a metal plate and a resin frame attached integral with the metal plate. Alternatively, when the first case half is made of resin, the second case half may be formed only of a metal plate as is the case of FIGS. 12, 15 and 18. Resin materials suitably used for the first case half and the frame of the battery pack 20 may be thermoplastic resin materials. For example, thermoplastic resin materials such as polycarbonate, liquid crystal polymer, a compound of polycarbonate and acrylic butadiene styrene rubber, polypropylene, polybutylene terephthalate, polyphenylene sulfide, and so on may be used (Col 18 lines 59-67); (Col 19 lines 1-16).

Regarding a power generating element formed of a plurality of electrode plates and separators, Hayama et al. teach that although the first to fifteenth embodiments each comprise a film type flat battery cell including an electric power generating element comprised of positive and negative electrodes and an electrolyte disposed therebetween, a film type flat battery cell of this invention may include, for example, an electric power generating element obtained by forming a spiral laminator into a flat shape. The spiral laminator is obtained by spirally wounding a laminator comprised of positive and negative electrodes and a separator interposed therebetween (Col 29 lines 29-40):

Regarding electrode terminal lead coupled to the electrode plate, Hayama et al teach that, a terminal base 6i having a protrusion 6h formed on the top surface and shaped complementary to the recess 6g, and leads 6c formed on the bottom surface is positioned below the sealing 4A.sub.4. Next, the circuit board 6 and the terminal base 6i are pressed into contact to sandwich the positive and negative tabs 1a, 2a between the protrusion 6h and the recessed terminals 6g to form electric connection between the flat battery cell B.sub.1 and the circuit board 6. Subsequently, the lower case 34 having windows 34d at locations corresponding to the leads 6c is prepared and attached to the upper case 32 to complete the battery pack 30 (Col 16 lines 45-58).

Regarding forming a thermally welded portion on an outer periphery of the laminate film, Hayama et al teach that the electric power generating element A is wrapped by two sheets of armor materials 4, for example, Al laminate films, where peripheral portions of the armor materials 4 are thermally fused. In FIG. 22, reference

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numerals 4A₁, 4₂, 4A₃, 4A₄ designate four sealings of the armor materials 4 (Col 1 lines 41-50).

Hayama et al do not specifically teach a plurality of through holes in the electrode lead. However, Suzuki et al. disclose a sheet type electrochemical element (title) wherein, a polypropylene sheathing material is used to seal the terminals 7 and 8. The terminals 7 and 8 have through holes 11 which receive sheathing material (Paragraph 0024) (See Drawings 5 and 6). Regarding first and second rows of through holes, Suzuki et al. disclose multiple rows of through holes (See Drawing 6). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the through holes and sheathing material of Suzuki et al. into the battery of Hayama et al because Suzuki et al. teach that the through holes with sheathing material increases the tensile strength of the cell (Paragraph 0024).

Hayama et al as modified by Suzuki et al. do not specifically teach that the through holes are offset. However, Scott discloses an apparatus for supporting plants "title" wherein by offsetting the apertures, an increase in integral strength can be provided as compared to a single row of holes without any offset between adjacent surfaces (Col 3 lines 34-45). Therefore it would have been obvious to incorporate the offsetting of through holes of Scott into the sheet type electrochemical element of Hayama et al as modified by Suzuki et al because Scott teach that, an increase in integral strength can be provided as compared to a single row of holes without any offset between adjacent surfaces (Col 3 lines 34-45).

With respect to claim 4, Hayama et al teach that the connection of the lands with the positive and negative tabs can be made for example by ultrasonic welding. Alternatively, the lands and the tabs may be adhered with an electrically conductive adhesive coated on connection surfaces thereof Col 15 lines 63-67).

With respect to claim 13, Regarding the shape of the through holes being arcuately-shaped. To make changes in the shape of the through holes is considered obvious. In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (The court held that the configuration of the claimed disposable plastic nursing container was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant.).

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et al (U.S. Patent No. 6,225,778 B1) in view of Suzuki et al. (Japanese Pub. No.11-345599) and further in view of Scott (U.S. Patent No. 5,425,203).

With respect to claims 1 and 9, Hayama et al disclose a battery pack wherein according to the present invention, there is provided a battery pack which comprises a flat battery cell including a flat electric power generating element, at least one armor material for sealing the flat electric power generating element, and a positive tab and a negative tab extending from the electric power generating element to the outside of the

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armor material through sealings of the armor material; a circuit board connected to the positive tab and the negative tab; and a container having two main walls extending along two main surfaces of the flat battery cell (Col 4 lines 33-50).

Regarding a laminate film formed by combining polymer and metal with each other, Hayama et al teach that the battery pack 20 of FIG. 7, the upper case (first case half) is not limited to that made of resin, but may be made, for example, of metal. With the upper case made of metal, a metal plate may be pressed to fabricate the first case half. Alternatively, the first case half may be cast by injection molding or the like. Metal materials used for the first case half may include aluminum, stainless steel, aluminum alloy, magnesium alloy, cold rolled steel plate, hot rolled steel plate, plated steel plate, and so on. Then, as a metal plate used for the second case half, similar metal plates to those mentioned above may be used. It should be noted that in the battery pack 20, when the first case half is made of metal, the second case half for use in combination with this must be such one that is composed of a metal plate and a resin frame attached integral with the metal plate. Alternatively, when the first case half is made of resin, the second case half may be formed only of a metal plate as is the case of FIGS. 12, 15 and 18. Resin materials suitably used for the first case half and the frame of the battery pack 20 may be thermoplastic resin materials. For example, thermoplastic resin materials such as polycarbonate, liquid crystal polymer, a compound of polycarbonate and acrylic butadiene styrene rubber, polypropylene, polybutylene terephthalate, polyphenylene sulfide, and so on may be used (Col 18 lines 59-67); (Col 19 lines 1-16).

Regarding a power generating element formed of a plurality of electrode plates and separators, Hayama et al. teach that although the first to fifteenth embodiments each comprise a film type flat battery cell including an electric power generating element comprised of positive and negative electrodes and an electrolyte disposed therebetween, a film type flat battery cell of this invention may include, for example, an electric power generating element obtained by forming a spiral laminator into a flat shape. The spiral laminator is obtained by spirally wounding a laminator comprised of positive and negative electrodes and a separator interposed therebetween (Col 29 lines 29-40).

Regarding electrode terminal lead coupled to the electrode plate, Hayama et al teach that, a terminal base 6i having a protrusion 6h formed on the top surface and shaped complementary to the recess 6g, and leads 6c formed on the bottom surface is positioned below the sealing 4A.sub.4. Next, the circuit board 6 and the terminal base 6i are pressed into contact to sandwich the positive and negative tabs 1a, 2a between the protrusion 6h and the recessed terminals 6g to form electric connection between the flat battery cell B.sub.1 and the circuit board 6. Subsequently, the lower case 34 having windows 34d at locations corresponding to the leads 6c is prepared and attached to the upper case 32 to complete the battery pack 30 (Col 16 lines 45-58).

Regarding forming a thermally welded portion on an outer periphery of the laminate film, Hayama et al teach that the electric power generating element A is wrapped by two sheets of armor materials 4, for example, Al laminate films, where peripheral portions of the armor materials 4 are thermally fused. In FIG. 22, reference

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numerals 4A₁, 4₂, 4A₃, 4A₄ designate four sealings of the armor materials 4 (Col 1 lines 41-50).

Hayama et al do not specifically teach a plurality of through holes in the electrode lead. However, Suzuki et al. disclose a sheet type electrochemical element (title) wherein, a polypropylene sheathing material is used to seal the terminals 7 and 8. The terminals 7 and 8 have through holes 11 which receive sheathing material (Paragraph 0024) (See Drawings 5 and 6). Regarding first and second rows of through holes, Suzuki et al. disclose multiple rows of through holes (See Drawing 6). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the through holes and sheathing material of Suzuki et al. into the battery of Hayama et al because Suzuki et al. teach that the through holes with sheathing material increases the tensile strength of the cell (Paragraph 0024).

With respect to the folding of the end of the laminate film, Hayama et al teach that the electric connection of the flat battery cell B₁ to the circuit board 6 is established by bending the positive and negative tabs 1a, 2a (only the positive tab 1a is illustrated in FIG. 6) toward a space 8' formed by the sealing 4A₄ and the upper case 12, likewise bending the lead pieces 6f of the circuit board 6 toward the space 8', and welding the tabs and the lead pieces, as illustrated in FIG. 6 (Col 14 lines 55-67). Hayama et al does not specifically teach folding of the end of the laminate film. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to also fold the end of the laminate film of Hayama et al. in addition to the folding of the

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lead and tabs because Hayama et al. teach that this folding saves space within the battery and contributes to a smaller size (Col 14 lines 55-67).

Hayama et al as modified by Suzuki et al. do not specifically teach that the through holes are offset. However, Scott discloses an apparatus for supporting plants "tile" wherein by offsetting the apertures, an increase in integral strength can be provided as compared to a single row of holes without any offset between adjacent surfaces (Col 3 lines 34-45). Therefore it would have been obvious to incorporate the offsetting of through holes of Scott into the sheet type electrochemical element of Hayama et al as modified by Suzuki et al because Scott teach that, an increase in integral strength can be provided as compared to a single row of holes without any offset between adjacent surfaces (Col 3 lines 34-45).

6. Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et al. (U.S. Patent No. 6,225,778 B1) as applied to claims 1, 2, 4, 5 and 9 above.

With respect to claim 3, Hayama et al disclose a battery pack in paragraph 2 above. Hayama et al do not specifically teach wherein a ratio of a cross-sectional area of the through-holes to a cross-sectional area of the electrode terminal lead ranges from 20-50%. However, it would have been obvious to one of ordinary skill in the art to

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adjust the cross-sectional area of the electrode terminal lead to arrive at the claimed ratio 20-50% between the through-holes and the terminal lead because terminal leads and battery sealing material may be of various thickness.

7. Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et al (U.S. Patent No. 6,225,778 B1) in view of Suzuki et al. (Japanese Pub. No. 11-345599) in view of Dasgupta et al. (U.S. Patent No. 6,080,508) and further in view of Scott (U.S. Patent No. 5,425,203).

With respect to claims 1 and 9, Hayama et al disclose a battery pack wherein according to the present invention, there is provided a battery pack which comprises a flat battery cell including a flat electric power generating element, at least one armor material for sealing the flat electric power generating element, and a positive tab and a negative tab extending from the electric power generating element to the outside of the armor material through sealings of the armor material; a circuit board connected to the positive tab and the negative tab; and a container having two main walls extending along two main surfaces of the flat battery cell (Col 4 lines 33-50).

Regarding a laminate film formed by combining polymer and metal with each other, Hayama et al teach that the battery pack 20 of FIG. 7, the upper case (first case half) is not limited to that made of resin, but may be made, for example, of metal. With the upper case made of metal, a metal plate may be pressed to fabricate the first case half. Alternatively, the first case half may be cast by injection molding or the like. Metal

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materials used for the first case half may include aluminum, stainless steel, aluminum alloy, magnesium alloy, cold rolled steel plate, hot rolled steel plate, plated steel plate, and so on. Then, as a metal plate used for the second case half, similar metal plates to those mentioned above may be used. It should be noted that in the battery pack 20, when the first case half is made of metal, the second case half for use in combination with this must be such one that is composed of a metal plate and a resin frame attached integral with the metal plate. Alternatively, when the first case half is made of resin, the second case half may be formed only of a metal plate as is the case of FIGS. 12, 15 and 18. Resin materials suitably used for the first case half and the frame of the battery pack 20 may be thermoplastic resin materials. For example, thermoplastic resin materials such as polycarbonate, liquid crystal polymer, a compound of polycarbonate and acrylic butadiene styrene rubber, polypropylene, polybutylene terephthalate, polyphenylene sulfide, and so on may be used (Col 18 lines 59-67); (Col 19 lines 1-16).

Regarding a power generating element formed of a plurality of electrode plates and separators, Hayama et al. teach that although the first to fifteenth embodiments each comprise a film type flat battery cell including an electric power generating element comprised of positive and negative electrodes and an electrolyte disposed therebetween, a film type flat battery cell of this invention may include, for example, an electric power generating element obtained by forming a spiral laminator into a flat shape. The spiral laminator is obtained by spirally wounding a laminator comprised of positive and negative electrodes and a separator interposed therebetween (Col 29 lines 29-40).

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Regarding electrode terminal lead coupled to the electrode plate, Hayama et al teach that, a terminal base 6i having a protrusion 6h formed on the top surface and shaped complementary to the recess 6g, and leads 6c formed on the bottom surface is positioned below the sealing 4A.sub.4. Next, the circuit board 6 and the terminal base 6i are pressed into contact to sandwich the positive and negative tabs 1a, 2a between the protrusion 6h and the recessed terminals 6g to form electric connection between the flat battery cell B.sub.1 and the circuit board 6. Subsequently, the lower case 34 having windows 34d at locations corresponding to the leads 6c is prepared and attached to the upper case 32 to complete the battery pack 30 (Col 16 lines 45-58).

Regarding forming a thermally welded portion on an outer periphery of the laminate film, Hayama et al teach that the electric power generating element A is wrapped by two sheets of armor materials 4, for example, Al laminate films, where peripheral portions of the armor materials 4 are thermally fused. In FIG. 22, reference numerals 4A₁, 4₂, 4A₃, 4A₄ designate four sealings of the armor materials 4 (Col 1 lines 41-50).

Hayama et al do not specifically teach a plurality of through holes in the electrode lead. However, Suzuki et al. disclose a sheet type electrochemical element (title) wherein, a polypropylene sheathing material is used to seal the terminals 7 and 8. The terminals 7 and 8 have through holes 11 which receive sheathing material (Paragraph 0024) (See Drawings 5 and 6). Regarding first and second rows of through holes, Suzuki et al. disclose multiple rows of through holes (See Drawing 6). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was

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made to incorporate the through holes and sheathing material of Suzuki et al. into the battery of Hayama et al because Suzuki et al. teach that the through holes with sheathing material increases the tensile strength of the cell (Paragraph 0024).

Hayama et al as modified by Suzuki et al. do not specifically teach at least two laminate packaging flat cells connected in series and/or parallel. However Dasgupta et al disclose packaging assembly for a lithium battery wherein such batteries are commonly made up of several lithium battery cells connected in parallel or in series, or located between a pair of single current collector sheets with electrodes mounted on the collectors in parallel arrangement and the array of cells folded to make a single battery having only two electrical terminals (Col 7 lines 35-50). Therefore it would have been obvious to one of ordinary skill in the art to incorporate the parallel or series arrangement of Dasgupta et al of the batteries of Hayama et al as modified by Suzuki et al. because Dasgupta et al teach that such batteries are commonly made up of several lithium battery cells connected in parallel or in series, or located between a pair of single current collector sheets with electrodes mounted on the collectors in parallel arrangement and the array of cells folded to make a single battery having only two electrical terminals (Col 7 lines 35-50).

Hayama et al as modified by Suzuki et al. as modified by Dasgupta et al. do not specifically teach that the through holes are offset. However, Scott discloses an apparatus for supporting plants "title" wherein by offsetting the apertures, an increase in integral strength can be provided as compared to a single row of holes without any offset between adjacent surfaces (Col 3 lines 34-45). Therefore it would have been

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obvious to incorporate the offsetting of through holes of Scott into the sheet type electrochemical element of Hayama et al as modified by Suzuki et al as modified by Dasgupta et al. because Scott teach that, an increase in integral strength can be provided as compared to a single row of holes without any offset between adjacent surfaces (Col 3 lines 34-45).

8. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et al (U.S. Patent No. 6,225,778 B1) in view of Suzuki et al. (Japanese Pub. No. 11-345599) in view of Haba (U.S. Patent No. 6,465,986 B1) and further in view of Scott (U.S. Patent No. 5,425,203)

With respect to claims 1 and 9, Hayama et al disclose a battery pack wherein according to the present invention, there is provided a battery pack which comprises a flat battery cell including a flat electric power generating element, at least one armor material for sealing the flat electric power generating element, and a positive tab and a negative tab extending from the electric power generating element to the outside of the armor material through sealings of the armor material; a circuit board connected to the positive tab and the negative tab; and a container having two main walls extending along two main surfaces of the flat battery cell (Col 4 lines 33-50).

Regarding a laminate film formed by combining polymer and metal with each other, Hayama et al teach that the battery pack 20 of FIG. 7, the upper case (first case half) is not limited to that made of resin, but may be made, for example, of metal. With the upper case made of metal, a metal plate may be pressed to fabricate the first case

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half. Alternatively, the first case half may be cast by injection molding or the like. Metal materials used for the first case half may include aluminum, stainless steel, aluminum alloy, magnesium alloy, cold rolled steel plate, hot rolled steel plate, plated steel plate, and so on. Then, as a metal plate used for the second case half, similar metal plates to those mentioned above may be used. It should be noted that in the battery pack 20, when the first case half is made of metal, the second case half for use in combination with this must be such one that is composed of a metal plate and a resin frame attached integral with the metal plate. Alternatively, when the first case half is made of resin, the second case half may be formed only of a metal plate as is the case of FIGS. 12, 15 and 18. Resin materials suitably used for the first case half and the frame of the battery pack 20 may be thermoplastic resin materials. For example, thermoplastic resin materials such as polycarbonate, liquid crystal polymer, a compound of polycarbonate and acrylic butadiene styrene rubber, polypropylene, polybutylene terephthalate, polyphenylene sulfide, and so on may be used (Col 18 lines 59-67); (Col 19 lines 1-16).

Regarding a power generating element formed of a plurality of electrode plates and separators, Hayama et al. teach that although the first to fifteenth embodiments each comprise a film type flat battery cell including an electric power generating element comprised of positive and negative electrodes and an electrolyte disposed therebetween, a film type flat battery cell of this invention may include, for example, an electric power generating element obtained by forming a spiral laminator into a flat shape. The spiral laminator is obtained by spirally wounding a laminator comprised of

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positive and negative electrodes and a separator interposed therebetween (Col 29 lines 29-40).

Regarding electrode terminal lead coupled to the electrode plate, Hayama et al teach that, a terminal base 6i having a protrusion 6h formed on the top surface and shaped complementary to the recess 6g, and leads 6c formed on the bottom surface is positioned below the sealing 4A₄. Next, the circuit board 6 and the terminal base 6i are pressed into contact to sandwich the positive and negative tabs 1a, 2a between the protrusion 6h and the recessed terminals 6g to form electric connection between the flat battery cell B.sub.1 and the circuit board 6. Subsequently, the lower case 34 having windows 34d at locations corresponding to the leads 6c is prepared and attached to the upper case 32 to complete the battery pack 30 (Col 16 lines 45-58).

Regarding forming a thermally welded portion on an outer periphery of the laminate film, Hayama et al teach that the electric power generating element A is wrapped by two sheets of armor materials 4, for example, Al laminate films, where peripheral portions of the armor materials 4 are thermally fused. In FIG. 22, reference numerals 4A₁, 4₂, 4A₃, 4A₄ designate four sealings of the armor materials 4 (Col 1 lines 41-50).

Hayama et al do not specifically teach a plurality of through holes in the electrode lead. However, Suzuki et al. disclose a sheet type electrochemical element (title) wherein, a polypropylene sheathing material is used to seal the terminals 7 and 8. The terminals 7 and 8 have through holes 11 which receive sheathing material (Paragraph 0024) (See Drawings 5 and 6). Regarding first and second rows of through holes,

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Suzuki et al. disclose multiple rows of through holes (See Drawing 6). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the through holes and sheathing material of Suzuki et al. into the battery of Hayama et al because Suzuki et al. teach that the through holes with sheathing material increases the tensile strength of the cell (Paragraph 0024).

Hayama et al as modified by Suzuki et al. do not specifically teach at least two battery modules connected in series and/or parallel. However Haba disclose a battery network with compounded interconnections wherein The EV1, for example, includes a battery pack consisting of 26 Valve-Regulated Lead Acid (VRLA) modules electrically connected together in a single series string for an available voltage of 312 Volts and a storage capacity of about 16.3 kW (Col 1 lines 25-40).

Therefore it would have been obvious to one of ordinary skill in the art to incorporate the parallel or series arrangement of battery modules of Haba of the batteries of Hayama et al as modified by Suzuki et al. because Haba et al teach that although the described embodiment of the battery operating system is a 120V, 48A battery pack, it should be realized that the battery pack may alternatively be configured, within the scope of this invention, to have different ratings and/or capacity. For example, lithium-ion or lithium-ion solid polymer batteries with different ratings may be used for savings in weight and size and increase in energy (Col 5 lines 31-52).

Hayama et al as modified by Suzuki et al. as modified by Haba et.al. do not specifically teach that the through holes are offset. However, Scott discloses an apparatus for supporting plants "tittle" wherein by offsetting the apertures, an increase in

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integral strength can be provided as compared to a single row of holes without any offset between adjacent surfaces (Col 3 lines 34-45). Therefore it would have been obvious to incorporate the offsetting of through holes of Scott into the sheet type electrochemical element of Hayama et al as modified by Suzuki et al. as modified by Haba et al. because Scott teach that, an increase in integral strength can be provided as compared to a single row of holes without any offset between adjacent surfaces (Col 3 lines 34-45).

Response to Arguments

9. Applicant's arguments filed on September 14th, 2006 have been fully considered but they are not persuasive.

Applicant's principal arguments are

(a) Hayama et al., further do not disclose a laminate packaging flat cell wherein the electrode terminal lead protrudes from the thermally welded portion, and a through-hole is provided in the electrode terminal lead in a position thereof contacting the thermally welded portion, wherein an end of the laminate film joined to the electrode terminal lead is folded on itself, as required by claim 5.

In response to Applicant's arguments, please consider the following comments.

(a) With respect to the folding of the end of the laminate film, Hayama et al teach that the electric connection of the flat battery cell B₁ to the circuit board 6 is established by bending the positive and negative tabs 1a, 2a (only the positive tab 1a is illustrated in FIG. 6) toward a space 8' formed by the sealing 4A₄ and the upper case 12, likewise bending the lead pieces 6f of the circuit board 6 toward the space 8', and welding the tabs and the lead pieces, as illustrated in FIG. 6 (Col 14 lines 55-67). Hayama et al does not specifically teach folding of the end of the laminate film. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to also fold the end of the laminate film of Hayama et al. in addition to the folding of the lead and tabs because Hayama et al. teach that this folding saves space within the battery and contributes to a smaller size (Col 14 lines 55-67).

Hayama et al do not specifically teach a plurality of through holes in the electrode lead. However, Suzuki et al. disclose a sheet type electrochemical element (title) wherein, a polypropylene sheathing material is used to seal the terminals 7 and 8. The terminals 7 and 8 have through holes 11 which receive sheathing material (Paragraph 0024) (See Drawings 5 and 6). Regarding first and second rows of through holes, Suzuki et al. disclose multiple rows of through holes (See Drawing 6). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was

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made to incorporate the through holes and sheathing material of Suzuki et al. into the battery of Hayama et al because Suzuki et al. teach that the through holes with sheathing material increases the tensile strength of the cell (Paragraph 0024).

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481.

The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ben Lewis


PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER

Patent Examiner
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